

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) An apparatus for sensing a potential rollover situation involving a vehicle, comprising:

an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion;

vehicle control devices arranged to affect control of the vehicle; and

a processor coupled to said inertial reference unit and said vehicle control devices and including an algorithm arranged to receive data from said inertial reference unit and control at least one of said vehicle control devices to apply at least one of the throttle, brakes and steering to prevent the rollover; and

location determining means for determining the location of the vehicle on a roadway, said processor being coupled to said location determining means and being arranged to consider the location of the vehicle when determining at least one of the existence of a potential rollover situation and the manner in which to control said at least one of said vehicle control devices.

2. (Canceled)

3. (Canceled)

4. (Original) The apparatus of claim 1, further comprising a navigation system coupled to said processor and arranged to provide information about a roadway on which the vehicle is traveling from a map database to said processor, said processor being arranged to process the data on vehicle motion and the roadway information and control a warning system to provide a warning to the driver upon detection of the potential rollover situation.

5. (Original) The apparatus of claim 1, wherein a first one of said accelerometers is arranged to sense vehicle acceleration in a latitude direction, a second one of said accelerometers is arranged to sense vehicle acceleration in a longitudinal direction and a third one of said accelerometers is arranged to sense vehicle acceleration in a vertical direction.

6. (Original) The apparatus of claim 1, wherein a first one of said gyroscopes is arranged to sense angular rate about the pitch axis, a second one of said gyroscopes is arranged to sense angular rate about the yaw axis and a third one of said gyroscopes is arranged to sense angular rate about the roll axis.

7. (Previously Presented) The apparatus of claim 1, wherein said processor is arranged to control all of said vehicle control devices to apply the throttle, brakes and steering to prevent the rollover, when necessary.

8. (Previously Presented) A vehicle, comprising:
tires;
a brake system arranged in connection with said tires to apply a braking force to said tires to reduce rotation of said tires; and
an apparatus for sensing a potential rollover situation involving a vehicle including
an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion; and
a processor coupled to said inertial reference unit and said brake system arranged to receive data from said inertial reference unit and control said brake system to apply the braking force to said tires to prevent the rollover.

9. (Previously Presented) The vehicle of claim 8, wherein said brake system includes a servo, said servo being controlled by said processor.

10. (Previously Presented) The vehicle of claim 9, wherein said processor includes an algorithm which receives the data from said inertial reference unit and outputs control signals for said servo.

11-13. (Canceled)

14. (Previously Presented) A vehicle, comprising:
an engine system arranged in connection with said tires to apply a motive force to said tires; and
an apparatus for sensing a potential rollover situation involving a vehicle including

an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion; and

a processor coupled to said inertial reference unit and said engine system and arranged to receive data from said inertial reference unit and control said engine system to regulate motive force being applied to said tires to prevent the rollover.

15. (Previously Presented) The vehicle of claim 14, wherein said engine system includes a servo, said servo being controlled by said processor.

16. (Previously Presented) The vehicle of claim 15, wherein said processor includes an algorithm which receives the data from said inertial reference unit and outputs control signals for said servo.

17. (Previously Presented) A vehicle, comprising:
an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion;

location determining means for determining the location of the vehicle on a roadway;
vehicle control systems arranged to affect control of the vehicle; and

a processor coupled to said inertial reference unit, said location determining means and said vehicle control systems and arranged to receive data from said inertial reference unit and control at least one of said vehicle control systems to prevent a rollover,

said processor being arranged to consider the determined location of the vehicle when determining at least one of the existence of a potential rollover situation and the manner in which to control said vehicle control systems.

18. (Previously Presented) The vehicle of claim 17, further comprising tires, said vehicle control systems including a brake system arranged in connection with said tires to apply a braking force to said tires to reduce rotation of said tires, a steering system arranged in connection with said tires to apply a directional steering force to said tires, and an engine system arranged in connection with said tires to apply a motive force to said tires, said processor being arranged to receive data from said inertial reference unit and control at least one of said brake system to apply the braking force to said tires to prevent the rollover, said steering system to apply a directional steering force to said tires to prevent the rollover, and said engine system to regulate motive force being applied to said tires to prevent the

rollover.

19. (Previously Presented) The vehicle of claim 18, wherein said brake system includes a brake servo controlled by said processor, said steering system includes a steering servo controlled by said processor and said engine system includes a throttle servo controlled by said processor.

20. (Previously Presented) The vehicle of claim 19, wherein said processor includes an algorithm which receives the data from said inertial reference unit and outputs control signals for said at least one of said brake servo, said steering servo and said throttle servo.

21. (Previously Presented) A vehicle, comprising:
an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion;
vehicle control systems arranged to affect control of the vehicle;
a processor coupled to said inertial reference unit and said vehicle control systems and arranged to receive data from said inertial reference unit and control at least one of said vehicle control systems to prevent the rollover; and
a navigation system coupled to said processor and arranged to provide information about a roadway on which the vehicle is traveling from a map database to said processor, said processor being arranged to process the data on vehicle motion and the roadway information and control a warning system to provide a warning to the driver upon detection of the potential rollover situation.

22. (Previously Presented) The vehicle of claim 21, wherein said processor includes an algorithm which receives the data from said inertial reference unit and outputs control signals for said at least one of said vehicle control systems and said warning system.

23. (Previously Presented) The vehicle of claim 21, further comprising tires, said vehicle control systems including a brake system arranged in connection with said tires to apply a braking force to said tires to reduce rotation of said tires, a steering system arranged in connection with said tires to apply a directional steering force to said tires, and an engine system arranged in connection with said tires to apply a motive force to said tires, said processor being arranged to receive data from said inertial reference unit and control at least one of said brake system to apply the braking force to said tires to prevent the rollover, said steering system to apply a directional steering force to said tires to prevent the

rollover, and said engine system to regulate motive force being applied to said tires to prevent the rollover.

24. (Previously Presented) The vehicle of claim 23, wherein said brake system includes a brake servo controlled by said processor, said steering system includes a steering servo controlled by said processor and said engine system includes a throttle servo controlled by said processor.

25. (New) An apparatus for sensing a potential rollover situation involving a vehicle, comprising:

an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion;

vehicle control devices arranged to affect control of the vehicle;

a processor coupled to said inertial reference unit and said vehicle control devices and including an algorithm arranged to receive data from said inertial reference unit and control at least one of said vehicle control devices to apply at least one of the throttle, brakes and steering to prevent the rollover; and

a navigation system coupled to said processor and arranged to provide information about a roadway on which the vehicle is traveling from a map database to said processor, said processor being arranged to process the data on vehicle motion and the roadway information and control a warning system to provide a warning to the driver upon detection of the potential rollover situation.

26. (New) The apparatus of claim 25, wherein a first one of said accelerometers is arranged to sense vehicle acceleration in a latitude direction, a second one of said accelerometers is arranged to sense vehicle acceleration in a longitudinal direction and a third one of said accelerometers is arranged to sense vehicle acceleration in a vertical direction.

27. (New) The apparatus of claim 25, wherein a first one of said gyroscopes is arranged to sense angular rate about the pitch axis, a second one of said gyroscopes is arranged to sense angular rate about the yaw axis and a third one of said gyroscopes is arranged to sense angular rate about the roll axis.

28. (New) The apparatus of claim 25, wherein said processor is arranged to control all of said vehicle control devices to apply the throttle, brakes and steering to prevent the rollover, when necessary.